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**PERSONALITY DIMENSIONS MODULATE WORKING MEMORY-RELATED CHANGES IN FUNCTIONAL BRAIN CONNECTIVITY**

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**Introduction:** Personality dimensions have been repeatedly associated with individual differences in brain organisation during cognitive processing, especially working memory (WM). WM consistently engages the lateral prefrontal (DLPFC), parietal (PAR) and the anterior cingulate cortex (ACC). Within this network, Neuroticism has been associated with attenuated DLPFC function and frontoparietal anatomical connectivity.

**Objectives:** To test that personality dimensions modulate task-dependent changes in effective connectivity within the WM network.

**Aims:** We predicted that WM-dependent changes in effective connectivity, will be either constrained or facilitated by personality traits.

**Methods:** We obtained fMRI data from 40 healthy adults while performing the 3-back WM task. Estimates of effective connectivity were obtained using Dynamic Causal Modelling based on a six-region model comprising bidirectional, ipsilateral and contralateral connections between the DLPFC, PAR and ACC. Personality dimensions were measured using the Neuroticism-Extroversion-Openness Personality Inventory-Revised.

**Results:** The 3-back memory load (WM modulation) significantly increased the forward connection from the right PAR to the right DLPFC. The strength of the WM modulation on right PAR→DLPFC was associated with improved response time ( $r=-0.33$ ,  $p=0.04$ ). Higher Neuroticism scores were associated with reduced WM modulation ( $r=-0.867$ ,  $p=0.001$ ), while the opposite was found for Conscientiousness ( $r=0.746$ ,  $p=0.001$ ).

**Conclusions:** We found that neuroticism and conscientiousness, respectively, constrain and facilitate the functional integration between parietal and frontal regions. Our results demonstrate that personality dimensions impact on WM task-dependent plasticity, as measured by changes in effective connectivity, and suggest that this plasticity may be a central link between individual differences in behaviour, cognitive efficiency and neural function.